

Serial No. 10/775,496
Amendment dated May 16, 2006
Reply to Office Action March 16, 2006

REMARKS

Rejections Under 35 U.S.C. 112

Claims 3-13 and 15 were rejected under 35 U.S.C. 112, first paragraph, as being "not commensurate with an enabling disclosure because applicant's specification requires specific amounts of cement, sand, coarse aggregate (i.e., limestone), and water to obtain a high-compressive strength".

The new head claim 15 in this proposed amendment gives specific proportions of limestone of various sizes as coarse aggregate and also ranges in the amounts of concrete, water, sand, and coarse aggregate. Dependent claims 18, 19, and 20 set forth more specific combinations. It is believed that the claims now presented recite specific useful ranges of quantities of cement, water, sand, and coarse aggregate and that the claims are not now objectionable under 35 U.S.C. 112, first paragraph.

Claims 3-13 and 15 were also rejected under 35 U.S.C. 112, second paragraph. This rejection was also based on the fact that the claims did not specify specific ranges of amounts of cement, sand, coarse aggregate and water to obtain compressive strength up to 5000 psi. Again, applicant's head claim 15 now supplies such ranges.

Serial No. 10/775,496
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Rejections Under 35 U.S.C. 103

Claims 3-13 and 15 were rejected under 35 U.S.C. 103(c) as being unpatentable over Turpin, Jr. '105 B1; Sawara et al. '831 B1; Wagh et al. '493; Urschel III et al. '716; GB 2085865 (Walters), or Yamamoto et al., alone or in view of Siegemann.

Applicant has now provided a head claim 15 which recites specific ranges of cement, water, sand, and coarse aggregate, and it is quite clear that none of the cited references come close to anticipating this claim.

While it is believed that one skilled in the art of mixing concrete to provide various strengths and other characteristics can design an acceptable mix, this is within the framework of certain established standards. Note that according to the Specification of Florida DOT, Section 346 Portland Cement Concrete (copy enclosed), one should "produce all concrete using Size No. 57 or Size No. 67 coarse aggregate". The nominal dimensions of these sizes are in the range from 25 to 4.75 mm and from 19 to 4.75 mm, respectively.

In general, these Sizes of aggregate are produced with very little or no aggregate smaller than 9.5 mm and, in particular, very little aggregate smaller than 4.75 mm. Consequently, limestone fines smaller than 9.5 mm are commonly rejected as limestone waste. There is some use of aggregate larger than 4.75 mm but almost no use of aggregate smaller than 4.75 mm. This is why great volumes of such "limestone waste"

Serial No. 10/775,496
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is accumulating at limestone quarries. Note that in a report by Florida University "Research and Techno-Economical Evolution: Uses of Limestone By-Products" (copy enclosed) primary fines smaller than 3/8 inch (or 9.5 mm) originate during primary crushing and sizing/washing of aggregate raw material prior to processing by the commercial products plant. These materials are commonly discarded as waste. According to said report, "the accumulation of fines (smaller than 3/8 inch) . . . is one of the major problems facing the industry today". As of today, such accumulations of "limestone waste" amount to in the order of four billion tons with more being added all the time.

Applicant has taught a very useful and economically valuable use for such fines in that such fines can provide the entire amount of aggregate required to produce concrete of the specified compressive strengths up to 5000 psi without requiring substantial amounts of additional cement.

In the patents of Turpin, Sawara, Wegh, Urschel, and Yamamoto, limestone dust was used as the addition to cement. As applied to GB 2085865, small grains limestone finer than 3mm was used in the same function. As the components of concrete, these cements with limestone powder or small grains limestone finer than 3mm as additions provide compressive strength of concrete up to 4,000-5,000 psi in the specific mixes with the coarse aggregates of regular sizes, fine aggregates and water.

While similar values of compressive strength were claimed, the coarse

Serial No. 10/775,496
Amendment dated May 16, 2006
Reply to Office Action March 16, 2006

aggregates used, being of regular sizes (mostly) would be substantially more expensive than applicant's concrete. The Examiner has stated, "control of particle size would have been an obvious design choice for one of ordinary skill in the art unless applicant can show criticality or an unexpected result".

One such unexpected result is the teaching that aggregate of the specified Sizes, all of which are deemed to be limestone waste, can, in fact, be used to produce concrete with the stated compressive strengths, without requiring excessive amounts of cement.

Another unexpected result is that such concrete is substantially less costly than concrete with aggregate of regular sizes because it can use such limestone waste. One of the reasons for discarding limestone aggregate than 9.5 mm is the belief that extra amounts of cement were required to produce adequate strength; such extra cement being a significant item of cost.

Applicants have amended the claims to remove the parentheses used in defining sieve sizes and have amended such recitations as suggested as "corresponding to sieve No. 8", for example.

The terminology "close to but not exceeding" has been shortened to "not exceeding".

It is believed that the claims presently in the application are properly allowable and favorable action is requested. Should the Examiner disagree, entry under the

Serial No. 10/775,496
Amendment dated May 16, 2006
Reply to Office Action March 16, 2006

provisions of 37 C.F.R. 1.116 is requested.

Respectfully submitted,



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Enclosures: Research and Techno-Economical Evolution: Uses of Limestone By-
Products"
Section 346 Portland Cement Concrete

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